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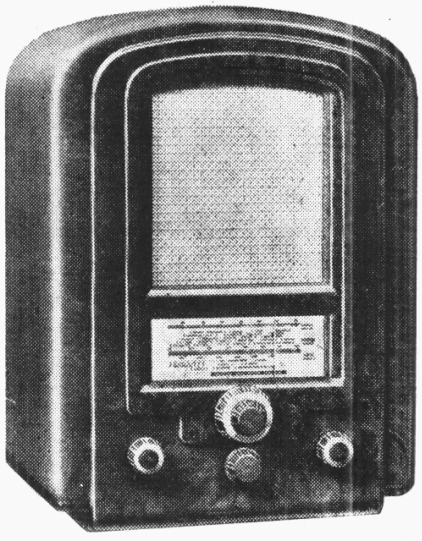
"TRADER" SERVICE SHEET

559

FERRANTI 1936-7 PARVA

ALL-WAVE AC/DC RECEIVER



THE Ferranti 1936-7 Parva All-Wave is a 3-valve (plus rectifier) 3-band TRF receiver, designed to operate from AC or DC mains of 200-250 V, 40-100 C/S in the case of AC. The SW range is 19.75-50 m.

On the SW band, the aerial circuit is untuned; in the RF stage, all bands are tuned, but reaction is applied only on SW.

Release date: October, 1936.

CIRCUIT DESCRIPTION

Aerial input on MW and LW via isolating condenser **C1** and coupling coils **L2, L3** to single tuned circuits comprising **L4** (MW), plus **L5** (LW), tuned by **C17.** Droitwich filter **L1, C16** may be connected across aerial circuit by external strap in cases where interference is experienced.

First valve **(V1, Ferranti metallised VPTS** or **Osram W31)** is a variable-mu pentode operating as RF amplifier with gain control by variable resistance **R4,** which varies GB applied. Its output is coupled by RF choke **L6** and **C5** to control grid of second valve **(V2, Ferranti metallised SPTS),** which operates as anode bend detector. GB is obtained from drop along **R8** on MW and LW, and from **R8** and **R9** connected in parallel via **S8** on SW. RF circuit tuning by **L8, C20** (SW), **L9, C20** (MW) and **L10, C20** (LW). Reaction is applied from anode via **L7** on SW only, and is controlled by variable condenser **C19.** RF filtering by **C8** on MW and LW, but on SW **S9** is open.

Resistance-capacity coupling by **R11, C9** and **R12** between **V2** and pentode output valve **(V3, Osram N31).** Fixed tone correction by **C12** in anode circuit.

When the receiver is operating with AC mains, HT current is supplied by IHC rectifying valve **(V4, Osram U30),** which, with DC mains, behaves as a low resistance. The two halves of this valve are strapped in parallel to operate as a half-wave rectifier. Smoothing by speaker field **L14** and electrolytic condensers **C13, C14.**

Valve heaters, together with scale lamp and ballast resistance **R16** are connected in series across mains input. Filter circuit comprising air-cored chokes **L15, L16** and condenser **C15** suppresses mains-borne interference, while fuse **F1** affords protection against short-circuits.

COMPONENTS AND VALUES

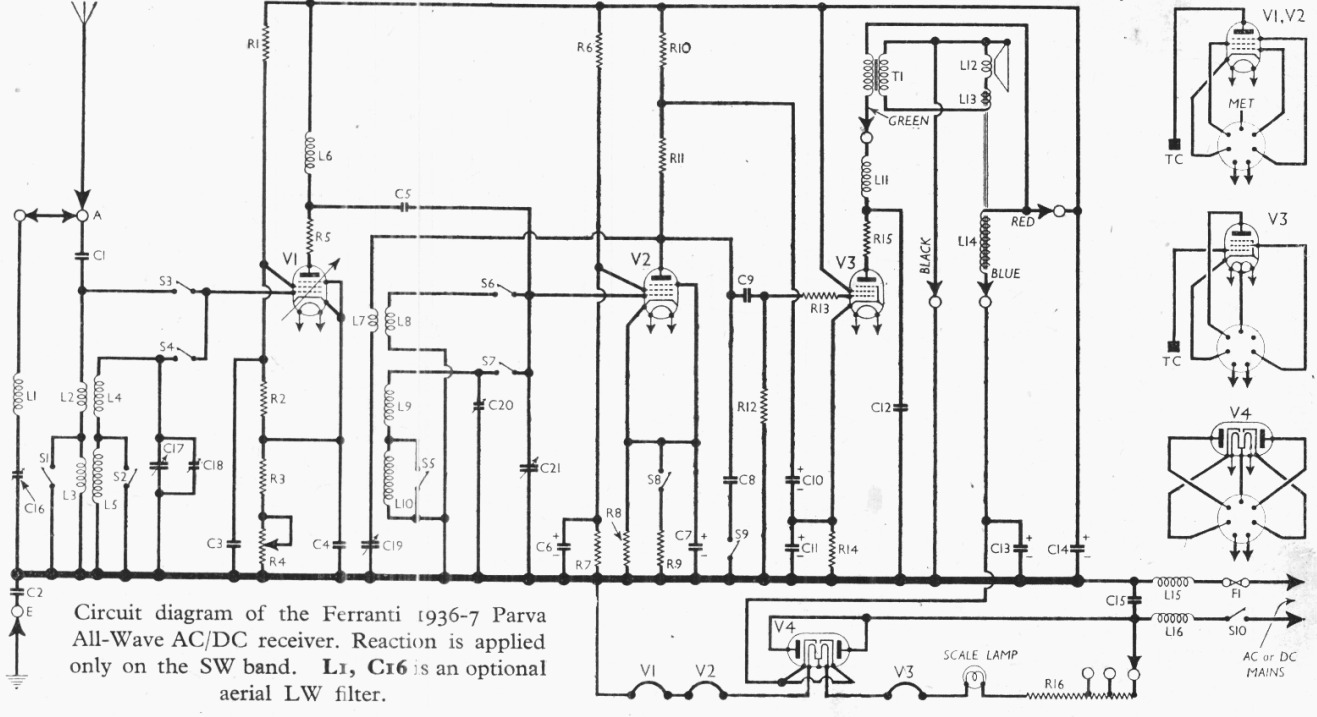
	RESISTANCES	Values (ohms)
R1	V1 SG HT feed potential divider	8,000
R2		50,000
R3	V1 fixed GB resistance ...	70
R4	V1 gain control	15,500
R5	V1 anode stabiliser ...	140
R6	V2 SG HT feed potential divider	250,000
R7		50,000
R8	V2 GB resistances ...	7,500
R9		3,500
R10	V2 anode decoupling ...	30,000
R11	V2 anode load	500,000
R12	V3 CG resistance... ...	1,000,000
R13	V3 grid stopper	50,000
R14	V3 GB resistance... ...	140
R15	V3 anode stabiliser ...	140
R16	Heater circuit ballast ...	550†

† Tapped at 350 Ω + 100 Ω + 100 Ω; or may be 350 Ω + 100 Ω + 50 Ω.

	CONDENSERS	Values (μF)
C1	Aerial isolating condenser	0·01
C2	Earth isolating condenser	0·05
C3	V1 SG decoupling ...	0·1
C4	V1 cathode by-pass ...	0·05
C5	V1 to V2 RF coupling ...	0·000018
C6*	V2 SG decoupling ...	6·0
C7*	V2 cathode by-pass ...	200·0

(*Continued overleaf.*)

* Electrolytic.



Circuit diagram of the Ferranti 1936-7 Parva All-Wave AC/DC receiver. Reaction is applied only on the SW band. **L1, C16** is an optional aerial LW filter.

	CONDENSERS (*Continued.*)	Values (μF)
C8	RF by-pass	0·00015
C9	V2 to V3 AF coupling ...	0·01
C10*	V2 anode decoupling ...	1·0
C11*	V3 cathode by-pass ...	50·0
C12	Fixed tone corrector ...	0·005
C13*	HT smoothing condensers	8·0
C14*		24·0
C15	Mains RF by-pass ...	0·05
C16‡	Droitwich filter tuning ...	—
C17†	Aerial circuit tuning ...	—
C18‡	Aerial circ. MW trimmer	—
C19†	Reaction control	0·0003
C20‡	RF circ. MW trimmer ...	—
C21†	RF circuit tuning ...	—

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Droitwich filter coil ...	40·0
L2	Aerial coupling coils ...	17·5
L3		68·0
L4	Aerial tuning coils ...	5·0
L5		41·0
L6	V1 anode RF choke ...	300·0
L7	SW reaction coil ...	1·0
L8	SW tuning coil... ...	0·03
L9	MW and LW RF tuning	4·9
L10	coils	26·5
L11	V3 anode RF choke ...	300·0
L12	Speaker speech coil ...	4·25
L13	Hum neutralising coil...	0·25
L14	Speaker field coil ...	700·0
L15	Mains filter chokes ...	3·0
L16		3·0
T1	Speaker input trans. Pri. ...	250·0
	Sec. ...	0·3
F1	Mains circuit fuse ...	—
S1-S9	Waveband switches ...	—
S10	Mains switch, ganged R4	—

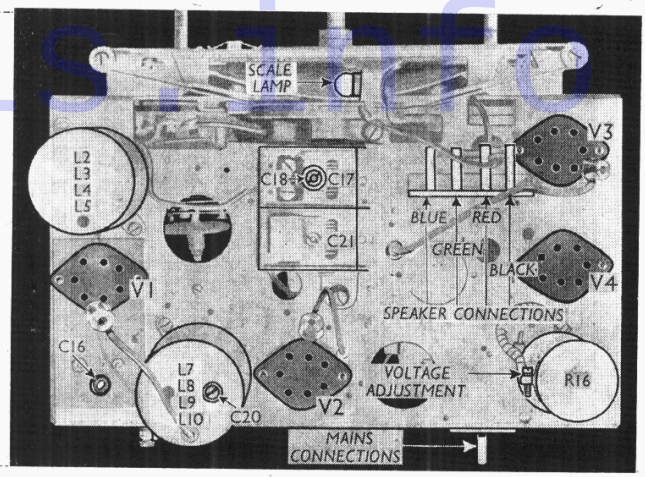
VALVE ANALYSIS

Valve voltages and currents given in the table below are those given in the makers manual. They were measured on an average receiver switched to MW and connected to AC mains of 225 V, with the gain control at maximum, and no signal input, using the 300 V scale of a Ferranti Circuit Tester (resistance 300,000 Ω) for voltage measurements, with the negative lead connected to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VPTS	185	1·5	125	6·5
V2 SPTS	50	0·15	20	0·05
V3 N31	170	34·0	190	8·5
V4 U30	—	—	—	—

DISMANTLING THE SET

Removing Chassis.—Remove the small tuning knob (recessed grub screw), and the remaining control knobs (pull-off);



Plan view of the chassis. The speaker connecting lead colour coding is shown, and it agrees with that marked in the circuit diagram overleaf.

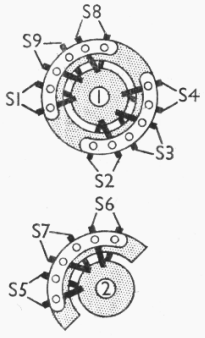
withdraw the four speaker connecting plugs from their sockets on the chassis deck;
remove the four screws holding the chassis to the bottom of the cabinet.

When replacing, connect the speaker leads as indicated by the colour coding in our plan view.

If the speaker has been removed, it should be replaced with the transformer uppermost.

GENERAL NOTES

Switches.—S1-S9 are the waveband switches, in two ganged rotary units beneath the chassis. These are indicated in our under-chassis view, and shown in detail in the diagrams (on right), where they are viewed from the rear of the underside of the chassis. The table (col. 3) gives the switch positions for the three control settings. A dash indicates open, and **C**, closed.



The switch units, as seen from the rear of the chassis.

Scale Lamp.—This is an Osram "S" type, with an MES base, rated at 6.5 V, 0.3 A.

Fuse F1.—The lower mains connecting plug at the rear of the chassis is connected to mains filter choke **L15** via a length of fine-gauge tinned copper wire, which acts as a fuse. If it should require replacing, 40 gauge wire should be used. Nothing heavier should be employed.

Condensers C13, C14.—These are two dry electrolytics, in a single rectangular cardboard container, rated at 500 V peak.

Droitwich Filter.—This is connected to the aerial circuit by a metal bar at the rear of the chassis. The bar, and the filter terminal shown in the circuit diagram, are only fitted to chassis dispatched to districts in the proximity of Droitwich.

Switch Table

Switch	SW	MW	LW
S1	—	C	—
S2	—	C	—
S3	C	—	—
S4	—	C	C
S5	—	C	—
S6	C	—	—
S7	—	C	C
S8	C	—	—
S9	—	C	C

Instability.—If the receiver becomes unstable when the gain control is at maximum (except at the bottom of the LW band) it may be stabilised for such purposes as alignment and valve voltage and current tests by short-circuiting one section of the gang. Stability under working conditions can be improved by so positioning the lead from the switch unit to **C17** that it is not close to the circular hole in the chassis deck.

CIRCUIT ALIGNMENT

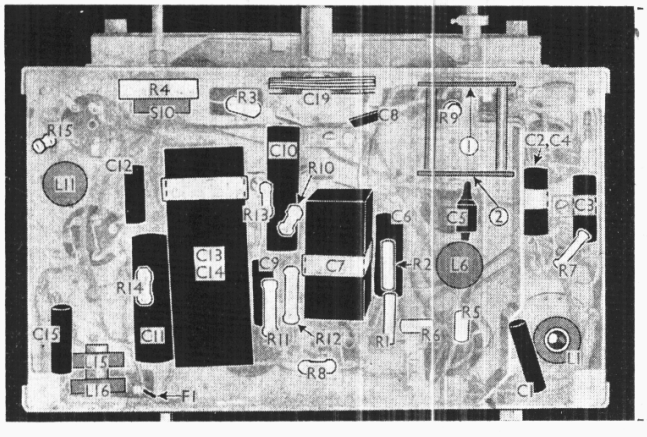
Connect signal generator via a suitable dummy aerial (a 0.0002 μF condenser may be used) to **A** and **E** sockets, and turn the gain control to maximum.

MW and LW.—Switch set to MW, feed in a 500 m (600 KC/S) signal, tune it in accurately, and adjust the pointer so that it registers with the 500 m mark on the scale. Now tune to 228 m on scale, feed in a 228 m (1,315 KC/S) signal, and adjust **C18** and **C20** for maximum output. Check calibration at 500 m.

Switch set to LW, feed in a 1,807 m (166 KC/S) signal, then a 1,128 m (266 KC/S) signal, and check the calibration at these points.

SW.—Replace dummy aerial with one suitable for SW (a 400 Ω resistance may be used), switch set to SW, feed in a 19.75 m (15.2 MC/S) signal, and tune it in. The pointer should register with the black line at the top of the scale. Finally, check calibration at 33 m (9.1 MC/S) and 50 m (60 MC/S).

Droitwich Filter.—This was intended to reduce interference from Droitwich in receivers located near the station. If this station, or another of nearly the same wavelength, is working, close the link connecting the filter, switch set to LW, feed in a *strong* signal of appropriate frequency, and adjust **C16** for *minimum* output.



Under-chassis view. The two switch units are indicated, and are numbered to agree with the detailed diagrams of the units above. **F1** is the mains circuit fuse wire.

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